



PROJECT-BASED LEARNING IN ELEMENTARY IN WESTERN UNITED STATES SCHOOLS

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ABSTRACT

Project-based learning (PBL) is a student-centered approach that has been required by state and school-level leadership, but the teachers have not received formal training before implementing it in their classes. This study explored the perception of current PBL implementation among teachers and administrators at an urban elementary school, focusing specifically on fidelity and adaptations. The research questions guiding this study asked what administrators perceive as the intent of PBL instruction and what teachers perceive as the nature of implementation in their classrooms. This qualitative exploratory case study included an analysis of data from interviews, observations, and the relevant documents of five teachers and two administrators. Teachers were observed in class and interviewed about the PBL implementation evident during the observations. Internal documents in the analysis where the documentation related to the planning and implementation of PBL was reviewed. The strategy used to analyze the data focused on answering smaller subquestions in order to answer the larger research questions about the nature of PBL in this setting. Themes were recorded as any recurring patterns emerged from the data. Evidence was displayed through a narrative of the analysis as a means of allowing readers to review for reliability. The final results from this study may contribute to social change by helping leaders improve teacher training and the practice of PBL implementation.

KEYWORDS: Problem-based learning, student-centered, elementary school education, teacher education, problem-based learning implementation.

INTRODUCTION:

Reports of the concentration of public school students eligible for free or reduced-price lunch data from the National Center for Education Statistics¹ show that 24% of all schools in the United States (U.S.) serve a high-poverty community. In response to this nation-wide equity issue, state departments of education have required schools to implement instructional measures, including project-based learning (PBL), to promote equity and excellence². Understanding more about what intentions administrators have for PBL may provide insight into what barriers one may need to address in order for successful PBL buy-in among teachers to take place. Teachers may not be providing their students with PBL instruction³.

It is essential to investigate the fidelity of implementation (FOI) of PBL instruction in a school so that the program can ultimately reach the goals for which it was designed³. High-impact interventions such as PBL programs go through stages of development and adoption that school leaders should evaluate if schools are going to avoid spending unnecessary resources engaging in ineffectual practices³. Insight into PBL implementation may inform teachers, administrators, and other stakeholders about the critical components of PBL and the relationships between those components. The purpose of this qualitative case study was to explore implementation in such a way as to shed light on the relationship between the intended practice and practical adaptation.

The problem at Pacific Elementary School (PES, a pseudonym), a P-5 urban school in the Western United States, is that teachers are not implementing PBL with fidelity. The state offered PBL training to the teaching staff in the PES district, but teachers chose not to attend the training. As none of the teachers had received training yet, the PES principal provided literature on the subject. The school purchased a PBL science curriculum, but few teachers could show evidence of implementation. PES administration had conducted no formal observations of PBL (PES vice-principal, personal communication, August 12, 2018).

While no observations had yet been made in this school, even while PBL was being encouraged among the teaching staff, it could not be assumed that no form of PBL or no form of any critical component of PBL existed in the school. This study, explored any adaptations of PBL. In the most recent literature reviews of PBL instruction, much of the research focused on barriers to implementation⁴. There is an apparent lack of research on the adaptations to planned PBL instruction that teachers may employ. Based on a detailed review of the literature, it is clear that more research of actual implementation at an elementary school level would be useful⁴.

PES administration has made PBL instruction a priority initiative. This study included the administrators' perceived intentions for PBL instruction and explored what impact they may have had on the instructional plans that teachers created. In a study⁴, researchers analyzed both student perception data and teacher perception data. Administrator perception has not yet been incorporated into an analysis of PBL implementation⁵.

The following research questions focused on understanding what PBL instruction looks like in practice at PES. These questions were developed to explore what gaps may exist between the intended use of PBL and the actual use of PBL in the classroom:

Rq1: According to administrators, what is the intended use of PBL instruction in the curriculum?

RQ2: What is the nature of PBL instruction in PES classrooms?

The following subquestions were used to identify specifics of PBL use at PES:

Sq1: What do teachers report are the instructional critical components present in their PBL curriculum?

Sq2: What do teachers report are the structural critical components present in their PBL instruction?

Sq3: What critical components do teachers omit from their PBL curriculum?

Sq4: What critical components do teachers omit from their PBL instruction?

SQ5: What critical components exist in the classroom apart from what teachers report?

MATERIALS AND METHODS:

Using a qualitative case study, a purposeful heterogeneity sampling technique to select the participants for this study. Heterogeneity sampling is a technique aligned to the tradition of qualitative exploratory research where the research question is focused on identifying the essential features of a phenomenon.

Observations:

Sensitive to cases that may be considered typical as well as those that may prove to be outliers, observations of PBL instruction within the context may be beneficial⁵. Informants were made aware of the focus of the study and arrange a time that would be optimal to observe PBL practices. Observing the teacher's behavior within the mediating context would provide data that would help to address the research questions. The study used fieldnotes and these observations to inform the interview questions. Specific questions aim at having the teacher explain the meaning of what was observed, thereby facilitating an accurate interpretation of the data.

Justification: Observations provide real-time, context-rich data that is necessary for addressing the research questions⁵. In this study, the research questions ask about the immediate context of PBL implementation. Direct observation is a valuable source of data. When triangulated adequately with data from other sources, observational fieldnotes can prove to be valuable validation of insights⁶.

Source of instrumentation: Data collection instrumentation is often designed by researchers to fit the specific focus of the study at hand⁶. The observation protocol is researcher-designed to focus on addressing the research questions posed in this study. The research questions highlight a need to observe the practices that teachers implement and those that they omit. Direct observation is a useful source of data for gaining insight into current and relevant phenomena^{5,6}.

Sufficiency of method: The research questions driving this inquiry could not be answered using archival data or historical documentation. As such, direct observation is both sufficient and necessary to capture the relevant behaviors of participants. Observation of specific practices in classrooms may be able to capture what participants may not reveal through interviews alone⁵. Data gathered through observations and interviews may be used to complement one another^{5,6}.

Collecting and recording data: After arranging an appropriate time and place to observe PBL practices with the teacher, observations were conducted using direct observations of 45-90 minutes. While aiming to generate descriptive field notes, this study attempted to capture the events and environment with as few inferential notes as possible. These were recorded on a document generated using Google docs and saved in a password-secured account. An observation protocol was used as a tool to record data on the behavior of the participants as well as reflexive notes.

Interviews:

Interviews of participants are necessary for understanding the meaning assigned by teachers to the practices they employ regarding PBL implementation⁶. Following the classroom observation, a separate meeting with participants was used to conduct semi-structured interviews. Serving as a time for debriefing teachers on what was observed, these teachers were invited to explain certain behaviors and their relationship to the fidelity of PBL implementation within their classroom. Interviews provide an opportunity to gain potentially clarifying data. These interviews were audio recorded and transcribed using Nvivo as a means for accurate coding⁶. Nvivo identified themes that emerged from interview transcripts. Arranging a time and place to conduct interviews can start once IRB approval was granted.

Justification: Where the observations help attain data on what happens in the classroom and how things are implemented, the interviews during this study provide essential data about why certain things were implemented⁵. Independent of observations, interviews would still be necessary for the study at hand as they are ideal for ascertaining data about the perception and experience of participants⁵. The research questions highlight a need for understanding the way teachers perceive PBL implementation. Through 60-minute semi-structured interviews, the goal of getting teacher perception data about PBL implementation can be achieved.

Document Review:

The relevant documents that the school already has been included in this study^{5,7}. These include PBL planning templates that the school's administration has made available for teachers; data team minutes in which teachers note their next steps for implementation or other documents provide insight into the implementation of PBL. Since the review of relevant existing documentation may take longer than expected, participants were enlisted to watch for documentation that are relevant to PBL⁸. The collection of documentation were facilitated through the use of Google Drive, as this is a secure way to share documents easily.

Justification: The stability of using documentary evidence is well established in the case study design⁵. At PES, much of the planning and resource material that administrators had provided to teachers on PBL is readily available in their Google Drive. This availability means that gaining access to such documentation for inclusion into this study would be feasible and unobtrusive compared to other sources of data^{5,6}. Qualitative documentation in the form of meeting minutes and notes that teachers have generated for use in PBL implementation are necessary to include in an exploratory case study focused on analyzing the critical components present in the implementation.

RESULTS:

In the data gathered, themes and subthemes regarding the intentions and practice of PBL at PES are apparent. Themes found in the data include information about meeting the needs of English language learners, increasing engagement, critical components of PBL, omissions or adaptations, and the perceived level of practice that educators have at PES. The intended and actual practice of PBL seen at PES is largely oriented around the needs of the students. Teachers and administrators have explained that PBL is intended to engage students who are learning English as a second language. The critical components that participants described, like collaboration and authenticity, were strategies meant to attend to these students' specific needs. Certain omissions and adaptations were observed. The most notable was the absence of collaboration or inquiry in a kindergarten class as well as the ubiquity of technology in every class.

All the participants described their practice of PBL as being in its beginning stages. One teacher explained that there is a need for a training that includes being able to observe a more experienced teacher's practice of PBL. One of the administrators mentioned that there is a need for implementation to be taken to

the next step through a reflecting on previous practice and refining implementation. By addressing the needs identified in the data, there may be a way to better support teachers and increase student achievement.

An analysis of the data revealed that PES teachers and administrators perceive their practice of PBL as being in its beginning stages. Some suggested that with ongoing reflection on their instruction, their instructional units could be refined and improved. Analysis revealed that participants felt there could be improvements with more time and training that includes opportunities to observe other teachers. Interview data revealed that PES was currently trying to balance the time spent in their data team and articulation meetings between PBL planning and targeted strategies for meeting more specific academic gaps. Based on the analysis of this data, a model for PBL planning and a 4-day professional development was developed.

DISCUSSION:

Future research might include a study to track the changes in practice over time which may provide administrators with insight into new ways to support teachers' professional development. Findings in other studies of new learning methods make clear that the significance of an approach can only be measured in terms of its long-term effects⁷.

Further research may include replicating the research study in a different region. Research on professional development shows that results can differ for certain training and interventions when implemented in rural as opposed to urban settings⁹. Results may differ if the study were conducted in different countries as PBL has been implemented elsewhere with varying degrees of success. A larger sample size may provide insights that were not available by exploring just one school. The data set may lead to different conclusions if all the schools in the district were included in a similar study.

The purpose of this qualitative exploratory case study was to investigate how PES teachers may or may not be implementing PBL instructional strategies to support students in the classroom. The strength of this research study is that it provides a direct and structured approach to training instructional teams to implement PBL with greater fidelity. By organizing the learning activities within a PLC framework, this research helps to address concerns of consistent delivery of instruction within and among grade-level teams. Increased consistency across grade-levels allow for a common vocabulary about PBL implementation. This approach may benefit grades 3-5 the most as it requires grades K-2 to consistently provide PBL instruction. School-wide alignment of PBL understanding, goals, and implementation is designed to yield greater student achievement in every classroom.

One solid strength of this research study is that it addresses concerns about sustainable fidelity and acceptable adaptations. By using a model for growth that is designed to use PLCs, these results can help leaders to develop a school's ability to build the capacity of teachers to take on roles of greater responsibility over time. This is a healthy expectation, as the school already requires teachers to meet regularly and plan instruction. As this research spans the course of an entire year of instruction, enough time is allotted to see stable change occur before the conclusion of the final session.

One limitation for this research study is the possible cost to the participating school. Because the design of the research requires teachers to plan together, implement what they have planned, observe one another, and share findings throughout the year, finding the funds necessary for substitute teachers may be a barrier to implementation. Though the school has done such school-wide trainings during the normal school day before, the current economic constraints of this year may limit the school's ability to access similar funds for the following year. Getting public or private grants may mitigate this limitation.

Another limitation to implementation is the possible lack of time. The data shows that teachers feel the lack of time is a limitation to what they may be able to accomplish in a day. The proposed model may help address this concern through providing tools that help focus discussions during meetings and professional conversations. The tools included in this model may further help address the limitation of time by making the time that teachers spend on planning and reflecting more effective toward instructional change.

CONCLUSIONS:

This qualitative exploratory case study sought to examine the nature of PBL implementation at an urban elementary school. Seven participants were interviewed (5 of whom were observed) to collect data about the intentions and the actual practice of PBL at the school. An analysis of the perception data revealed that omissions and adaptations of the PBL critical components were apparent. The data suggested the need for a training that provided a clear understanding of PBL implementation and an accelerated professional growth model that would build teacher capacity over time.

Through the research, there were no findings on any training or strategy that would make an impact if it could not have a lasting effect on teacher practice after the training was over. To have any real significance, the training would have to incorporate common components from both andragogy and PBL. Soft skills

such as communication, creativity, and collaboration had to be part of the model if the training would have any lasting effect. Insights from this research study suggested that the model needed to account for acceptable adaptations to practice. By addressing the school's need to purposefully adapt and develop leadership skills among teachers over time, this research study may promote positive social change.

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